

# Acute Pneumonia In Adults: A Retrospective Clinical Study On The Response To Penicillin In Malawi

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## ABSTRACT:

A retrospective study was carried out between January 1990 to December 1992. One hundred and sixty patients were admitted with acute pneumonia to Trinity Hospital, a mission hospital in the South of Malawi, and the response to penicillin was evaluated. 31% of the patients did not respond to penicillin and needed a broad spectrum antibiotic to be cured.

## INTRODUCTION

Pneumonia is a common reason for hospital admission and a major cause of death in Malawi and in tropical Africa as a whole<sup>1,2</sup>. The most common aetiological agent is *Streptococcus pneumoniae*<sup>3,7</sup>. Other frequent causative organisms to be considered are *Haemophilus influenzae*<sup>3</sup> and *Mycoplasma pneumoniae*<sup>6</sup>. In HIV-positive patients the same pattern is seen. *Pneumocystis carinii* pneumonia occasionally occurs in these patients in Africa, but with much less frequency compared with Europe and North America<sup>8</sup>.

Parenteral penicillin is commonly recommended as the first treatment of choice<sup>2,3,5,7,9</sup>. However, 10% or more of patients with acute pneumonia do not respond to penicillin<sup>2,3,5</sup>. Chloramphenicol or doxycycline are recommended as second line drugs<sup>9,10</sup>. This study was undertaken to determine the response to penicillin in acute pneumonia in a rural area in Malawi.

## PATIENTS AND METHODS

The study was carried out in Trinity Hospital, a 200 bed mission hospital in the Lower Shire Valley in Malawi. A retrospective review was made of case notes of all adult patients admitted under the care of the author with acute pneumonia between January 1990 and December 1992. The diagnosis of acute pneumonia was made on clinical grounds. Criteria required for the diagnosis were either an auscultatory finding of bronchial breathing or fine inspiratory crepitations, together with at least two of the following: 1. history of cough of recent onset; 2. history of/or clinically detectable fever (38° C); 3. history of pleuritic chest pain. The following patients were excluded: those with chronic cough (more than 2 weeks), tuberculosis (sputum positive and sputum negative), chronic lung disease, cardiac disease and patients with pleural effusions.

On admission to hospital, a history was taken and a physical examination performed. Haemoglobin was routinely measured. A HIV-test was done only when a pa-

tient showed symptoms of AIDS related complex (ARC) or AIDS. All patients were initially treated with benzylpenicillin 1 mega unit every 6 hours for 24 hours followed by procaine benzylpenicillin 900,000 units every 12 hours for 6 days. All patients routinely received anti-malarial chemotherapy. Treatment was given in hospital. Patients were reviewed twice a week and treatment was changed to a broadspectrum antibiotic if there was no clinical improvement after a minimum of 72 hours on penicillin. Criteria for no improvement were: 1. persistent fever; 2. persistent crepitations and/or bronchial breathing; 3. persistent chest pain; 4. persistent cough. (one or a combination of these criteria).

Statistical analysis was carried out with the X<sup>2</sup>-test.

## RESULTS

One hundred and eighty four patients with acute pneumonia were admitted during the study period. Twenty-four of these patients were excluded because treatment was started with an antibiotic other than penicillin. The remaining 160 patients were included in the study.

The average age of the patients was 36 years (range 13-70 years) and 65% were female. The main presenting symptoms and signs are in Table 1. Haemoglobin was less than 10 g/dl in 62% of patients (n=149). A HIV-test was carried out on 18 patients and 13 were HIV-seropositive.

Table 1. Main presenting symptoms and signs in 160 patients with acute pneumonia.

Symptoms	No(%)
Recent cough	144 (90)
Chest Pain	134 (84)
Fever	121 (76)
Tachypnoea (30 rpm)	91 (57)
Creptitations	153 (96)
Bronchial Breathing	49 (31)

There were two deaths in the whole group, both of the patients being HIV-seropositive.

Fifty patients (31%) did not respond to penicillin, and treatment was changed after a mean period of 5 days on penicillin. Thirty-eight of these received chloramphenicol, 7 ampicillin and 5 co-trimoxazole. The reasons for changing to a broadspectrum antibiotic are given in Table 2. Thirty-five patients in this group (70%) had 2 or more reasons for changing treatment. No penicillin hypersensitivity reactions were observed. Six of the patients who were HIV-seropositive did not respond to penicillin, and two of these six patients died.

Mean duration of hospital stay for the whole group was 9 days. Mean duration of hospital stay for patients who did not respond to penicillin and who needed another antibiotic was 14 days.

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## DISCUSSION

This study shows that a high proportion of patients (31%) failed to respond to penicillin, and this is significantly different compared with other hospital based studies (10%) (p,  $X^2$ -test)<sup>2,3,5</sup>. In this study there was a higher proportion of female patients (65%) compared with other studies (25%)<sup>2,3,5,6</sup>. However, there was no significant difference between the percentage of non responders to penicillin in female (30%) and male (32%) patients (p0.1,  $X^2$ -test), so the difference in sex-ratio did not influence the results. It is suggested that a change of antibiotic treatment in acute pneumonia be considered after 48 hours if there is no clinical improvement<sup>9,10</sup>, so the methodological guidelines followed in this study were appropriate. The majority of those failing to respond to penicillin (70%) had at least 2 clinical signs of persisting infection, and this further justifies the change in antibiotic treatment. There was no significant difference in the response to penicillin in the patients with ARC or AIDS compared with the other patients (p0.1,  $X^2$ -test)

The reasons for penicillin failure remain speculative. Apart from the two deaths, all non-responders had good results with chloramphenicol, ampicillin or co-trimoxazole. Further research should be carried out to determine the reasons for penicillin failure.

## CONCLUSION

The majority of adults with acute pneumonia can still be treated with penicillin. However the results of this study demonstrate that 31% of patients admitted to our hospital do not respond to penicillin. This is a higher percentage compared with reports from other countries in Southern Africa, and this places a question mark over the belief that penicillin is the drug of first choice.

Table 2. Reasons for a change to broad spectrum antibiotics in 50 patients with acute pneumonia not responding to penicillin

Reason	No(%)
Persistent Crepitations and Consolidation	48 (96)
Persistent Cough	25 (50)
Persistent Fever	20 (40)
Persistent Chest Pain	15 (30)

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